



# MISSOURI CONSERVATIONIST

VOLUME 79, ISSUE 7, JULY 2018  
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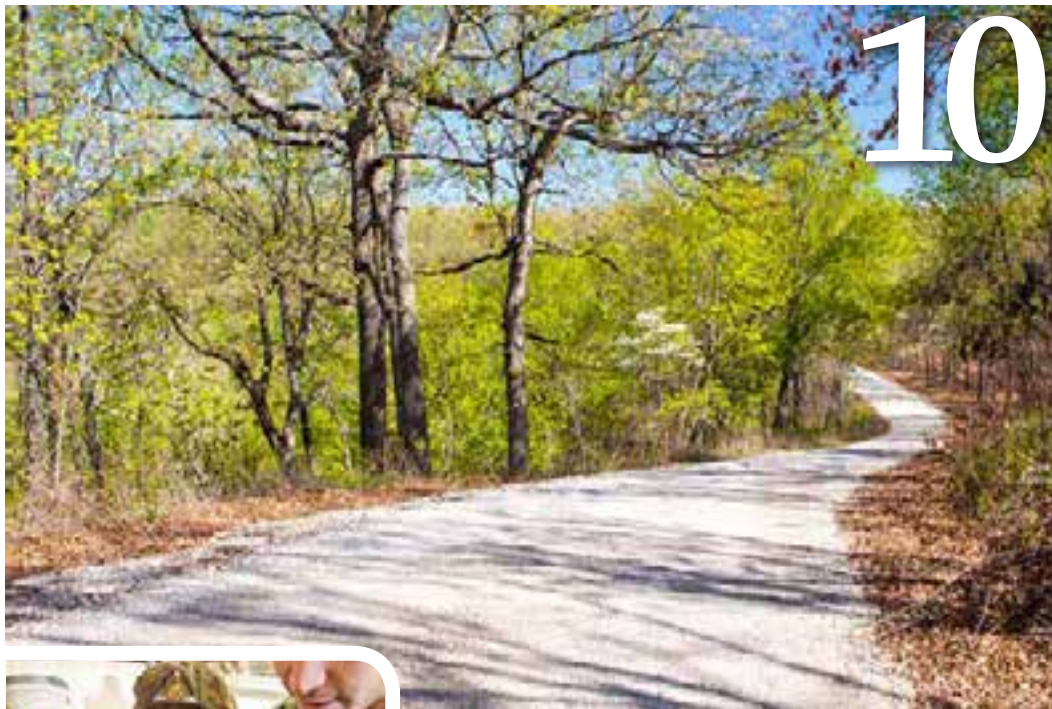
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# Contents

JULY 2018  
VOLUME 79, ISSUE 7



## FEATURES

**10**  
**Missouri Conservation:**  
**Design for the Future**  
New strategic plan highlights  
conservation priorities.

**16**  
**A Day in the Life of a**  
**Wildlife Veterinarian**  
Caring for Missouri's wildlife today,  
conserving them for the future.  
by Kristie Hilgedick

**22**  
**On the Wing**  
How to hit a flying target.  
by Brent Frazee



## DEPARTMENTS

- 2 Inbox
- 3 Up Front With Sara Parker Pauley
- 4 Nature Lab
- 5 In Brief
- 28 Get Outside
- 30 Places To Go
- 32 Wild Guide
- 33 Outdoor Calendar



MISSOURI  
CONSERVATIONIST



## ON THE COVER

Prairie blazing star  
in full bloom

## 📷 NOPPADOL PAOTHONG

180mm macro lens  
f/32, 1/15 sec, ISO 200

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# Inbox



## Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email [Magazine@mdc.mo.gov](mailto:Magazine@mdc.mo.gov) or write to us:

MISSOURI  
CONSERVATIONIST  
PO BOX 180  
JEFFERSON CITY, MO 65102



## A LEARNING TOOL

Our household has been a long-time subscriber to the *Missouri Conservationist*. We all love it. We use it for school projects and reference it often when we explore nature.

Kristy Macko  
Kansas City

## LOCAL POND MANAGEMENT

I have been a reader for over half a century and have always enjoyed the magazine. I recently went to the MDC office in Hannibal for advice on pond weed control. Travis Moore, the fisheries biologist, spent a lot of time helping me identify the specific aquatic weed problem that I had and advised me on the proper, safe chemical to use to take care of the issue. I did as he suggested and my pond is now better than it has been for years. I want to thank MDC and specifically Travis Moore for his assistance and time. You folks are a credit to the state of Missouri.

Jim Frier Ralls County

## LOVE FROM JERSEY

I had the pleasure of reading your most interesting and wonderfully written magazine from April 2018. I was totally taken by the letter sent via email by Ray Bozarth (Inbox, Page 2), regarding *The Eastern Screech-Owl* article (February, Page 16), sharing his summer memories feeding the owl with mice caught at his farmhouse some 40 years ago. What a summer that must have been! I know how exciting it is for me just hearing the owls in our area and if I should see one, what a blessing!

Keep up all of your fantastic work. I have two sons that subscribe to your magazine, one living in St. Louis, who introduced us to your magazine, and another living in town who shares your special magazine with me. I am a very fortunate reader. Thank you!

Ruth Peters West Caldwell, NJ

## ATLATL

I enjoyed the atlatl article in your June issue a bunch [*Throwing a Stick With a Stick*, Page 22]. For all the curious archers out there, 100 miles per hour, the obtainable speed given for an atlatl in the article, converts to 146.7 feet per second. Not bad!

Larry Davis Springfield

## MONARCH MIGRATION IN MEXICO

Thanks to your informative article on the monarch butterfly migration in the September 2017 issue (*The Butterfly Effect*, Page 10), I was able to encounter the phenomenal experience first-hand. My daughter arranged the excursion for a birthday present. We visited the El Rosario Reserve, and upon reaching the top of the mountain, was an incredible experience of nature. Thousands upon thousands of monarchs congregating on the oyamel fir trees and flying overhead like leaves floating through the sky. I want to thank Mexico for sharing their hospitality to monarchs. I hope this will also encourage people to plant milkweed, so future generations can experience this.

Rhonda Reise Hillsboro

## ADDITIONAL INFORMATION

On Page 18 of the May issue [*Eating Close to Home*], MDC Education Specialist James Worley is filleting a buffalofish. The fish beside him, which wasn't identified in the caption, is a common carp. To learn more about these fish species, visit our field guide online at [short.mdc.mo.gov/ZZW](http://short.mdc.mo.gov/ZZW). —THE EDITORS



Common carp

Buffalofish

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## Have a Question for a Commissioner?

Send a note using our online contact form at [mdc.mo.gov/commissioners](http://mdc.mo.gov/commissioners).





### Want to see your photos in the Missouri Conservationist?

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email Readerphoto@mdc.mo.gov,  
or include the hashtag #mdcdiscovernature  
on your Instagram photos.



1

1 | Sowards Ford  
Access by **Naomi  
Grace Thomsen**,  
via email

2 | Red fox by  
**billy716\_**, via  
Instagram

3 | Bullfrog by  
**Kevin Wilson**, via  
Flickr



2



3

### MISSOURI CONSERVATION COMMISSIONERS



Don  
Bedell



Marilynn  
Bradford



David  
Murphy



# Up Front

with Sara Parker Pauley

✖ As a child, I was a voracious reader and would devour everything from the Nancy Drew series to the western sagas told by Zane Grey and Louis L'Amour. One of my favorite writers was Alf Wight, who went by the pen name James Herriot. He wrote the well-known series of novels about being an English veterinarian with tales of the people and animals he cared for. His first novel, *All Creatures Great and Small*, was my favorite.

I thought of this title last week as I was walking outside with a refilled hummingbird feeder in hand. It was about dusk, and the hummers were frantically buzzing about, circling, chasing each other to and fro. I wondered what would happen if I just stood still with the feeder on the palm of my hand. It didn't take long for a tiny ruby-throated hummer to daringly come right in for a drink. How beautiful and perfect this small creature was — just inches from me. All creatures great and small, I thought.

You'll read a wonderful story this month about our own wildlife veterinarian, Dr. Sherri Russell (see *A Day in the Life of a Wildlife Veterinarian* on Page 16), who has the incredible responsibility of serving our citizens and our wildlife. She reminds me of a modern-day Dr. Herriot because of her kind heart, inquisitive mind, and exceptional caretaking of our precious wild creatures, regardless of their size or stature.

*Sara Parker Pauley*

**SARA PARKER PAULEY**, DIRECTOR  
SARA.PAULEY@MDC.MO.GOV

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[mdc.mo.gov](http://mdc.mo.gov) 3



# Nature LAB

by Bonnie Chasteen

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

## RESOURCE SCIENCE

### Thermal Infrared Photography

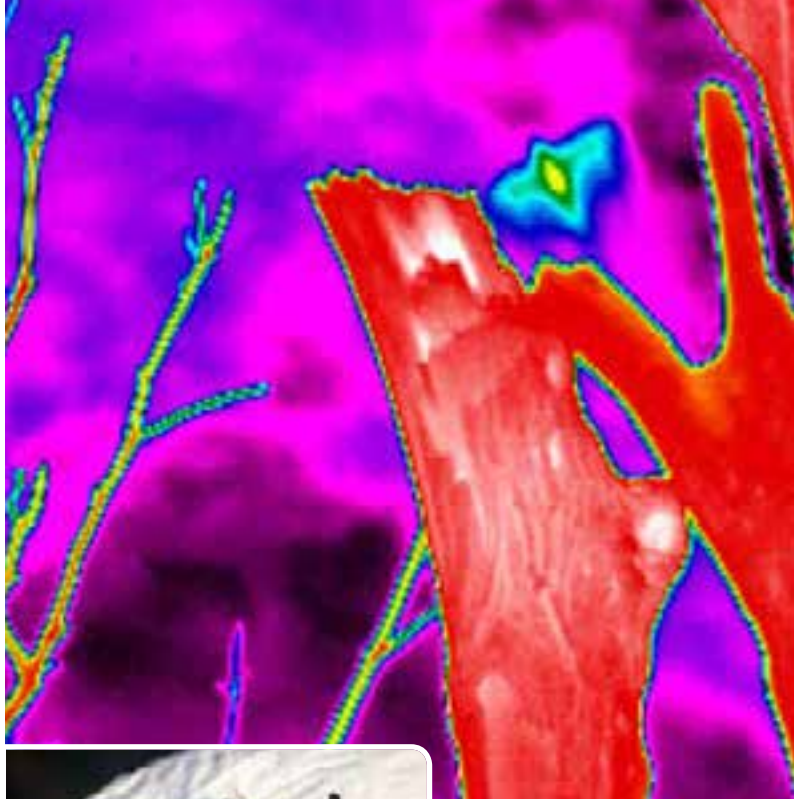
✳ **Resource Scientist Darren Thornhill** likes doing technical science, so when his work team at MDC's Northeast Regional Office in Kirksville needed to test infrared technology, he stepped up. A top infrared camera company doubted whether thermal imaging could help the team detect bats roosting under tree bark, but Thornhill persisted.

"I'd found several scientific studies that used infrared to identify tree disease, especially mold," he said.

Mold holds water, which is cooler than the rest of the tree and therefore creates a clear contrast on a thermal image. "If you can use infrared to figure that out," he said, "you can use it to figure out where a little mammal is under the tree bark."

To prove the concept, Thornhill and his team tucked hand warmers under the bark of tree stumps and took thermal images of them. It worked like a charm.

The team then used the camera to find trees where bats were roosting during the day. This enabled them to set up mist nets so they could catch, identify, and attach radio-tracking devices to the bats when they emerged at night.



Thermal images show where bats roost, improving researchers' ability to trap, identify, and monitor them. In addition to the federally listed Indiana bat shown here, many Missouri bats are facing disease, habitat loss, and other threats.

MDC resource scientists are the first to use infrared imaging to identify the roosting trees of endangered Indiana bats

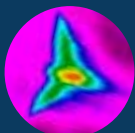
"The infrared images can't tell us what species of bat is roosting in a dead tree," Thornhill said. "But those images can tell us where to focus monitoring and management efforts."

The federally endangered Indiana bat is a major target of the team's efforts, but other kinds of tree-roosting bats benefit, too. "Because of threats like white-nose syndrome, which kills bats that winter in caves, it's important to know what trees host bats and how our management can help them," Thornhill said.

### Thermal Infrared Photography at a Glance

#### How it works

The camera detects and records a heat signature, which is the pattern of the animal's body heat that emanates to the surface.



Number of bats it takes to produce a detectable heat signature: **1**

Length of time before a bat's heat signature appears: **1 minute, 38.8 seconds**

Length of time before a bat's heat signature dissipates: **About 35 minutes**

Number of federally listed bat species in Missouri that could benefit from thermal photography: **2**



Indiana bat



Northern long-eared bat

Browse more research topics at [research.mdc.mo.gov](https://research.mdc.mo.gov)


INFRARED IMAGES: DARREN THORNHILL; BATS: SHELLY COLASKE



# In Brief

News and updates from MDC



 First time frogging? Get tips from MDC at [youtube.com/watch?v=d\\_2mau\\_GlFE](https://youtube.com/watch?v=d_2mau_GlFE).

## DISCOVER NATURE THROUGH FROGGING

IT'S A GREAT WAY  
TO INTRODUCE  
KIDS TO HUNTING

➔ Frogging season begins June 30 at sunset and ends Oct. 31. Missouri has two frog species that are legal game — bullfrog and green frog.

The daily limit is eight frogs of both species combined, and the possession limit is 16 frogs of both species combined. Only the daily limit may be possessed on waters and banks of waters where hunting. Daily limits end at midnight, so froggers who catch their daily limits before midnight and then want to return for more frogging after midnight must remove the daily limit of previously caught frogs from the waters or banks before returning for more.

Frogging can be done with either a fishing permit or a small-game hunting permit. Children under the age of 16 and Missouri residents 65 years of age or older are not required to have a permit.

Those with a fishing permit may take frogs by hand, hand net, atlatl, gig, bow, trotline, throw line, limb line, bank line, jug line, snagging, snaring, grabbing, or pole and line.

With a small-game hunting permit, frogs may be harvested using a .22-caliber or smaller rimfire rifle or pistol, pellet gun, atlatl, bow, crossbow, or by hand or hand net. The use of artificial light is permitted when frogging.

For more information about frog hunting, including how to get started and tasty recipes to try, visit [short.mdc.mo.gov/ZZm](https://short.mdc.mo.gov/ZZm).



### CELEBRATE SAFELY TO PREVENT WILDFIRES

As you celebrate this summer, be extremely careful with fireworks, campfires, and other sources of fire that could cause a wildfire.

#### Fireworks

Don't light fireworks in any areas where the sparks could ignite dry grass, leaves, or other potential fire fuel. Always have an approved fire extinguisher and an available water supply to douse sparks or flames. Wet the area around where fireworks are being discharged. Check with local ordinances and authorities for bans on fireworks and open burning.

#### Outdoor Burning

Don't burn during the wrong conditions. Dry grass, high temperatures, low humidity, and wind make fire nearly impossible to control. Check with local fire departments regarding burn bans that may be in place. A person who starts a fire for any reason is responsible for any damage it may cause.

#### Driving Off Road

Wildfires can start when dry fuel, such as grass, comes in contact with catalytic converters. Think twice before driving into and across a grassy field. Never park over tall, dry grass or piles of leaves that can touch the underside of a vehicle. When driving vehicles off road, regularly inspect the undercarriage to ensure that fuel and brake lines are intact and no oil leaks are apparent. Always carry an approved fire extinguisher on vehicles that are used off road. Check for the presence of spark arresters on ATV exhausts.

#### Making a Campfire

Clear a generous zone around fire rings. Store unused firewood a good distance from a campfire. Never use gasoline, kerosene, or other flammable liquid to start a fire. Keep campfires small and controllable. Keep fire-extinguishing materials, such as a rake, shovel, and bucket of water, close. Extinguish campfires each night and before leaving camp, even if it's just for a few moments.

#### Call for Help

Call 911 at the first sign of a fire getting out of control.

#### Report Forest Arson

Wildfires are sometimes set by vandals. Help stop arson by calling 800-392-1111 and reporting any potential arson activities. Callers will remain anonymous and rewards are possible.

#### Managed Fire

Fire used in the wrong way can create disasters. Used in the right way, fire can help create habitat for wildlife. For more information on using prescribed fire as a land-management tool, visit [short.mdc.mo.gov/ZqV](http://short.mdc.mo.gov/ZqV).

## Ask MDC

### Got a Question for Ask MDC?

Send it to [AskMDC@mdc.mo.gov](mailto:AskMDC@mdc.mo.gov)  
or call 573-522-4115, ext. 3848.

**Q: I recently noticed grass stems meticulously stuffed into holes bored into these logs. Do you know what might have caused this to happen?**

→ This is likely the work of grass-carrying wasps in the genus *Isodontia*.

In the early summer, adult female wasps emerge from their cocoons, mate, and locate suitable nesting sites. Each female collects grass blades and hay stems to line the cavity. Flying with the blades trailing, the queen lands at the hole and enters it, pulling the grass behind her. In this situation, it appears the wasps used tunnels bored by longhorned beetle larvae.

If the grass stems were to be removed, we suspect tree crickets and a few wasp larvae would fall out. These wasps are not aggressive, and these logs can be safely left in place until the larvae have a chance to develop and leave, which could be in a few weeks.

**Q: When do eastern gray and eastern fox squirrels bear their young?**

→ Depending on the vigor of the female, Missouri's squirrels can have two litters in a year. Most litters are



born in February or March and July or August. The female typically bears two to three young and is solely responsible for their care. If a nest is disturbed, she'll often move them, grasping the babies by the loose belly skin with her teeth as they hang on with their legs and tail.

**Q: I was in my garden taking photos when I saw this caterpillar. I started to brush it off the flower, thinking it was dried debris. Upon closer examination, I noticed it had collected bits of vegetation. I would love to know what it is.**

→ This is the camouflaged looper caterpillar (*Synchlora aerata*). It is the only widespread caterpillar species that adorns itself with plant fragments — usually flower petals. Spiny





**Camouflaged  
looper caterpillar**

projections on the caterpillar's back hold the fragments in place. By camouflaging themselves in this manner, these caterpillars are less noticeable to hungry predators.

Underneath their petal costumes, camouflaged loopers have mottled black, white, and brown bodies. These caterpillars can be found in fields and other open habitats from southern Canada to Georgia. They feed on

a wide variety of plants but are frequently seen eating the flowers of asters and raspberries.

This strange-looking caterpillar will transform into a small, beautiful moth called a wavy-lined emerald. These moths are pale green with wavy lines and are commonly seen throughout Missouri. Both caterpillars and moths of this species can be found from May through October.

## What IS it?

Can you  
guess this  
month's  
natural  
wonder?

*The answer is on  
Page 9.*



## AGENT ADVICE

from

**Lexis Riter**

JEFFERSON COUNTY  
CONSERVATION AGENT

Summer is a great time to discover nature, and there's no better place to start the adventure than Missouri's conservation areas. From hunting and fishing to hiking, bird-watching, and nature viewing, the state's conservation areas offer something for everyone. MDC areas are open for your enjoyment daily from 4 a.m. to 10 p.m. If you are on an area for an authorized activity — like fishing — then you are permitted to remain beyond these posted hours. This rule is in place for the safety of all our visitors, to keep our areas clean, and for the protection of our fish, forest, and wildlife resources.

Find an area  
near you at  
**short.mdc.**

**mo.gov/  
Z4V.** Get  
out and  
discover  
nature!





# WE ARE CONSERVATION

Spotlight on  
people and partners

## Bonnie Hinman

→ Surviving Joplin's 2011 tornado inspired Hinman to get involved in nature programs that make a difference. She completed the Missouri Master Naturalist Program training, and a year later she became a Stream Team volunteer. She also helps out at local events.

### She's a master of show-and-tell

Hinman loves to teach and write. In particular, she has a knack for showing how keystone species like crayfish hold a natural community together. Conservation Education Consultant Jeff Cantrell appreciates her insights and skills. "I simply love having her on a project that deals with public outreach," he said.

### In her own words

"If you're seriously interested in helping others learn about nature, become a master naturalist. There are Missouri Master Naturalist chapters all over the state, and they all have training classes where you learn a lot about many different things. Another great program is Missouri Stream Team. These programs help me improve my small corner of the world."

by Noppadol Paothong



With her hands still red with pigment, Hinman pauses outside her watershed demonstration booth at last year's Shoal Creek Water Festival.

What's **your** conservation superpower?





## APPLY ONLINE FOR MANAGED DEER HUNTS

Starting July 1, hunters can apply for a chance at more than 100 managed archery, muzzleloader, and modern firearms deer hunts throughout the state. Hunts will take place from mid-September through mid-January and some will be held specifically for youth or people with disabilities. To apply, visit [mdc.mo.gov/managedhunt](http://mdc.mo.gov/managedhunt).

The application period is July 1–31. Hunters are selected by weighted random drawing, and results will be available Sept. 1 through Jan. 15. Applicants who are drawn will receive area maps and other hunt information by mail.

Find more information in the 2018 *Fall Deer & Turkey Hunting Regulations and Information* booklet, available starting in early July at MDC offices and nature centers, permit vendors around the state, and online at [mdc.mo.gov](http://mdc.mo.gov).



## FACEBOOK LIVE WITH DIRECTOR SARA PARKER PAULEY AND AGENTS

Join MDC Director Sara Parker Pauley for a Facebook Live session on Wednesday, July 18, from noon to 12:30 p.m. and ask her questions on a variety of MDC topics.

Then mark your calendar for another Facebook Live session on Wednesday, Oct. 31, from noon to 12:30 p.m. Join several conservation agents to ask questions and get answers on hunting, fishing, trapping, and other MDC regulations.

Join the conversations by going to our Facebook page at [facebook.com/moconservation](https://facebook.com/moconservation) on the day and time of each session. Ask questions by posting them in the comments section.

## WHAT IS IT?

### BLACKBERRIES

About this time every year, berry pickers brave scratches and chiggers to collect juicy blackberries (*Rubus allegheniensis*) for pies, preserves, or just plain eating. Blackberries are produced on fast-growing, colony-forming shrubs, which can be found in rocky, open woods, along bluffs and fencerows, on glades, in thickets, old fields, and open valleys. Deep violet to black, these berries ripen between June and August, and the shrubs' white flowers bloom between April and June.





# MISSOURI CONSERVATION:

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# DESIGN FOR THE FUTURE

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*New strategic plan highlights  
conservation priorities*





## WHEN I BECAME THE NINTH DIRECTOR

of the Missouri Department of Conservation, I knew I had big shoes to fill. Undoubtedly, there have been lots of conservation giants pushing this department forward over the past 80 years, including brilliant scientific minds and innovative leaders. Their ability to effectively plan for the long-term through scientific research, public input, and sustained conservation funding has been pivotal to our success. We are now facing new 21st century conservation challenges, such as invasive species and wildlife diseases, that need our immediate attention and resources.

On my first day as director, I began working with our talented staff and dedicated partners on our new strategic plan. We began to develop from the ground up a road map for the next five years with input from hundreds of staff, volunteers, partners, and citizens from all over the state. We asked some tough questions.

Is there a better way to deliver conservation? How do we get there in a constantly changing world with finite conservation resources? How do we ensure that conservation of fish, forest, and wildlife resources stays relevant to the people already engaged while also reaching new people with limited exposure to the outdoors? What's our plan of action, step by step and year by year? And, equally important, how will we measure our success?



This road map, though far from perfect and always a work in progress, has the answers to some of those questions, including how we will live out our mission to conserve the fish, forest, and wildlife resources in Missouri and provide outdoor recreation opportunities across the state.

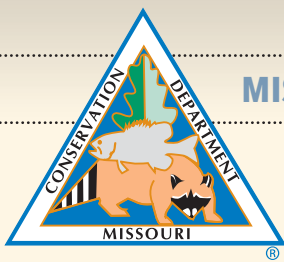
In this plan, called *Missouri Conservation: Design for the Future*, there are four big goals, 14 equally ambitious outcomes, and hundreds of targeted objectives — all with champions and teams pushing them forward and measurements tracking progress along the way.

While I'm so proud of all the work we've already done, the hard work continues as we put this plan into action starting this month. There is one thing I know for sure — we cannot do it alone. We need every citizen, partner, volunteer, and MDC employee helping us keep conservation front and center in Missouri. Our citizens have always been a key part of conservation — from the creation of the department 80 years ago to securing our dedicated funding to ensure we keep moving forward.

To all of you, thank you for being the best part of our story!

**SARA PARKER PAULEY**  
DIRECTOR





## MISSOURI CONSERVATION: DESIGN FOR THE FUTURE

### The Past Speaks Loudly and Eloquentlly

In the August 1975 issue of *Missouri Conservationist*, MDC's new *Design for Conservation* clearly outlined how the dedicated conservation sales tax dollars, being voted on the November 1976 ballot, would be prioritized to push conservation forward in Missouri. It so eloquently stated, "*Design for Conservation* is a plan to mitigate the relentless scrape and crunch of development. It is a chance for all Missourians to share in the



safeguarding of a historic outdoor heritage. Heritage is something passed along. How sad if all we pass to those who will remember us is noise and pollution and concrete. How sad never to hear the sweet voice of a bluebird, never to see the dogwoods in bloom, never to know the majesty of an oak-mantled Ozark bluff. That is sorrow we must not allow to occur in the tomorrow of our future."

The information outlined a strategic approach on how to safeguard that outdoor heritage in Missouri. It included conservation land acquisition; development of wetlands; preserving natural areas and endangered species;

increasing state forests and stream access; construction and operation of hatcheries; wildlife, aquatic, and forest research management services; law enforcement; information programs, including outreach and education; conservation education services, such as nature centers; enhancement of our great rivers' borders; and wildfire control.

These long lists of items have been priorities for MDC for the past 40 years. While many of these are ongoing each year, such as multiple-year scientific research studies and assistance to Missouri landowners, there are others that have been completed, thanks to the innovative thinking and long-term planning of this earlier strategic conservation plan. These include the

# GOAL 1

## SUSTAIN AND IMPROVE FISH, FOREST, AND WILDLIFE RESOURCES

### What we are working toward

Healthy and resilient populations of fish and wildlife, and the natural habitats that support them

### How we will deliver

- **Prioritize** restoration efforts in places where we can get the most results for our efforts
- **Manage** invasive species and disease
- **Practice** active land management
- **Work** with partners to improve the ecological functions of watersheds
- **Conduct** scientifically sound research
- **Recover** threatened and endangered species

### People, Partners, and Pollinators

The drastic decline of the monarch has spurred conservation action in Missouri and across the U.S. MDC has a unique partnership with more than 30 agencies and organizations on a monarch collaborative and pollinator conservation plan in Missouri. The Missourians for Monarchs collaborative has agribusiness, conservation organizations, academia, state and federal agencies, volunteer groups, and agriculture associations all working together on an aggressive goal of establishing more than 19,000 acres of pollinator habitat per year in Missouri.



Monarch butterfly



construction of new hatcheries, wetland areas, and nature centers and interpretive sites around the state. In October, the Springfield Conservation Nature Center will be celebrating its 30-year anniversary of connecting people with nature and helping them learn the importance of conserving it, too.

Missouri continues to be on the conservation forefront, both as a state-wide and national conservation leader, but also faces some daunting challenges, including new wildlife diseases, fast-spreading invasive species, and people disconnected from the outdoors. How do we build on the solid foundation and success of the *Design for Conservation*? We keep the strong foundation, but continue to refine, regroup, and rebuild better ways to deliver conservation today and tomorrow.

### Refining, Regrouping, and Rebuilding for the Future

Last year, as MDC celebrated 80 years with open houses around the state, staff collected citizen input to shape a new strategic plan. We asked, how are we doing? What are your thoughts on our regulations and infrastructure? What are your priority conservation topics? Most importantly, how can we partner with you to keep getting better? We also asked our staff and more than 100 partners the same questions. What emerged was a refined and rebuilt road map for the future.

*Missouri Conservation: Design for the Future* outlines priorities for the next five years from July 2018–June 2023. During that time, we will continue to include a high level of citizen participation, feedback, and measurement of conservation success while directing our efforts to the highest conservation priorities in a rapidly changing world. Our challenges include resource-related issues that will impact wildlife, land, and water, but also include big challenges we face as a society, such as a majority of people residing in urban areas and growing increasingly disconnected from nature. Driving our strategic approach to conservation is the realization that, as challenges evolve,

# GOAL 2

## ENHANCE THE RELEVANCE OF CONSERVATION

### What we are working toward

Missourians value and take action for conservation, and participate in nature-related activities and recreation

### How we will deliver

- **Establish** and strengthen partnerships
- **Provide** conservation information to the public
- **Engage** citizen input in regulatory decisions
- **Take** a community policing approach to law enforcement
- **Help** private landowners and local communities manage their natural resources
- **Empower** volunteers and citizen scientists
- **Deliver** a variety of educational programs

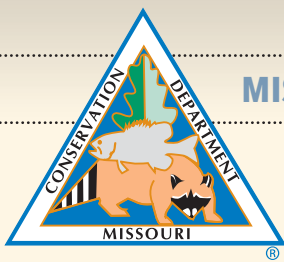
### Creative City Partnership Creates New Green Space

A partnership between MDC, the Green City Coalition Project, the City of St. Louis, the Mayor's Office, the St. Louis Sewer District, the Missouri Botanical Gardens, and other conservation partners is helping this urban St. Louis core think creatively about green space. There are more than 60 miles in inner city St. Louis where houses have become run down and abandoned over the years. As these uninhabitable houses are being torn down, partners are working together to make it a viable and productive green space with native plants to help pollinators. It is also a tremendous benefit to people, including their physical and emotional health, to have trees, native plants, and green space in the neighborhoods that they walk and drive by every day. This unique partnership has worked together on 80 properties so far with 1,000 more on the horizon.



Black-eyed Susans





## MISSOURI CONSERVATION: DESIGN FOR THE FUTURE

so must our approach and methods for engaging the next generation of conservationists.

Our answer to these challenges is built on a foundation of operational excellence, which is made possible by our world-class staff, prioritizing the

most important work in the most important places through strategic conservation, and delivering superior customer service. The focus on operational excellence also includes improving the business side of conservation to continue to be efficient, effective, and excellent stewards of Missouri taxpayer dollars.

Outlined in our five-year plan is an effort to strategically prioritize the most pressing conservation work for the state

of Missouri. MDC's strategic framework ensures our finite financial resources are invested in the most important conservation opportunities, including taking care of our current conservation footprint, for the enjoyment of current and future generations. While our plan will continue to evolve, we are striving to make the vision outlined on these pages a reality in the coming years. That is our commitment to you.

# GOAL 3

## CONNECT CITIZENS WITH FISH, FOREST, AND WILDLIFE RESOURCES

### What we are working toward

People have both physical and virtual places to go to enjoy and learn about nature

### How we will deliver

- **Increase** people's access to outdoor recreation opportunities near where they live
- **Offer** a range of conservation lands and facilities
- **Use** technology to connect people to conservation information and improve program delivery

### Exploring Nature With Technology

MDC's nearly 1,000 conservation areas cover close to 1 million public acres to conserve the fish, forest, and wildlife resources in Missouri, but also to provide opportunities for all citizens to use these resources. Most Missourians are within a 30-minute drive of an MDC conservation area. How do you know which ones are closest to you? Or how can you learn in minutes the activities allowed on an area, such as hiking, bird-watching, or fishing? MDC is launching a new mobile app this year to help people find a nearby conservation area with the quick tap of their phone, including outdoor activities and directions to the area. For more on MDC's free apps, visit [mdc.mo.gov/mobile](http://mdc.mo.gov/mobile).



Diana Bend Conservation Area

DIANA BEND CA: DAVID STONNER; ALLIGATOR GAR: NOPPADOL PAOTHONG



# GOAL 4

## STRENGTHEN OPERATIONAL EXCELLENCE TO DELIVER SUPERIOR CUSTOMER SERVICE

### What we are working toward

MDC is trustworthy and accountable, and has a world class staff that delivers superior customer service

### How we will deliver

- **Ensure** the effective and efficient use of taxpayer dollars
- **Recruit** and train a skilled workforce
- **Increase** understanding of our customers' needs and expectations
- **Maintain** citizen and partner trust through transparency

### Measuring Conservation Milestones and Successes

With our new strategic plan, MDC will launch a new measurement dashboard to track conservation milestones, outcomes, and successes. This tool will also be used to help us manage our strategic plan, budget directly to our priorities, achieve results through continuous process improvement, and measure progress toward our outcomes outlined in the strategic plan. In addition to staff, this measurement tool will be a resource we can share with our partners and Missouri citizens to show how our dollars and our work are benefiting — in real-time numbers — conservation across the state.

Alligator gar



For more information on  
**MISSOURI CONSERVATION: DESIGN FOR THE FUTURE,**  
including our comprehensive list of goals, outcomes, and  
key strategies, visit [short.mdc.mo.gov/ZqR](https://short.mdc.mo.gov/ZqR).



*A Day  
in the Life  
of a*

# **Wildlife Veterinarian**

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CARING FOR MISSOURI'S  
WILDLIFE **TODAY**,  
CONSERVING THEM FOR  
THE **FUTURE**

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by Kristie Hilgedick

In a demonstration for children at the State Fair, Dr. Sherri Russell, state wildlife veterinarian, shows how she uses a stethoscope to check vital signs.









**A** lifetime of being around animals, both domestic and wild, hasn't reduced Sherri Russell's passion for them one iota. In fact, it's probably only intensified her interest.

And so, when MDC's state wildlife veterinarian position opened, Russell knew she had to apply. Her ability to explain complex scientific concepts with stories, metaphors, and quite a bit of good humor helps in her daily job.

"This was a dream opportunity. I'm thrilled, completely thrilled, to be working for the wildlife and the citizens in Missouri," she said.

As a kid, Russell helped her uncle provide medical care to the sheep, goats, and cattle he raised on his farm. Those childhood experiences inspired Russell to pursue a career in veterinary medicine, and in 1985 she graduated from the University of Missouri with a doctorate in veterinary medicine.

"He was always very kind to animals," she said. "I felt, if that was what I did with my energies, it would be a good life."

Many people assume, incorrectly, an average workday for Russell involves resetting a deer's injured leg or administering antibiotics to a diseased hawk.

But that's not what the job entails.

MDC encourages people to leave wild animals in the wild. This is especially true with young animals that may appear to have been abandoned. There are exceptions, of course, mostly dealing with endangered species. MDC has strict regulations concerning wildlife rehabilitation and relies upon a statewide network of private and nonprofit rehabilitators to heal injured mammals, birds, and reptiles.

By periodically inspecting the hellbenders at Shepherd of the Hills Fish Hatchery (above left), Russell helps the staff identify bacterial diseases before they become problems. Russell performs a necropsy (above right) on a citizen-submitted white-tailed deer.

"I try to practice population medicine by helping entire communities of animals," she explained. "Instead of tending to individual animals, I'm tasked with caring for entire populations."

Russell works with Missouri's agricultural interests to prevent the transmission of diseases between wild and domestic animals.

"MDC has many partners to protect the state's natural resources. These interactions are very important for the health of domestic and wild species," Russell said.

She also supports MDC scientific researchers. At Peck Ranch in Shannon County, the veterinary care of the Missouri elk herd is mostly delivered by cervid biologists, but Russell collaborates with the researchers and offers advice.

"My involvement is really aimed at providing a veterinary perspective on the work they do," she said.

A key responsibility is disease surveillance. Many diseases not only have implications for Missouri's native wildlife, but also for domestic animals and people.

"Trying to understand where disease is on the landscape is job number one. We're the first line of defense," she said. "Seventy percent of all human diseases emerge from wildlife populations, so monitoring the presence of disease in wildlife is very important for human health."

## One Health

Russell is a proponent of the One Health concept, which recognizes that human health is inextricably linked with animals and the ecosystem. One Health asks the medical, scientific, conservation, and agricultural communities to collaborate to improve





“Instead of tending to individual animals, I’m tasked with caring for **entire populations.**”

—SHERRI RUSSELL, MDC’S STATE WILDLIFE VETERINARIAN



A microscope helps Russell check for parasites.

health for all species by accelerating biomedical research discoveries and expanding scientific knowledge.

“One Health is aimed at being collaborative, synergistic, enlightening, and cross disciplinary,” she explained. “For the natural resource professional, it offers a way of thinking that can enhance the mission of protecting fish, forests, and wildlife.”

At a conference at Lake of the Ozarks in early March, she led a workshop titled *Healthy Resources, Healthy You*.

“Historically, natural resource scientists who worked with deer or fish did not have to know about epidemiology and were unlikely to attend a talk about One Health,” she said.

But that’s changing.

Helping the team of biologists who are managing deer for chronic wasting disease (CWD) — a prion disease first discovered in Missouri in 2012 — has been one of her highest-profile and most-challenging duties.

Holding up a necklace of knobby red beads, Russell — a teacher at heart, if not by profession — said the strand reminded her of a string of amino acids.

“When you buy a protein bar, it says ‘12 grams of protein.’ What does that mean?” she asked rhetorically. “What I’m showing you here is a rough model of a protein. Each bead is representative of an amino acid, which bind together to form long chains of proteins. Proteins are one of the building blocks of life.”

Well, they are until they aren’t.

In the early 1980s, scientist Stanley Prusiner discovered prions, a class of infectious



self-reproducing pathogens primarily composed of proteins folding incorrectly on themselves.

"We know we have CWD prions. We know some prions are useful to animals, but we also know CWD prions aren't good," she said. "So how do you get rid of them?"

Unfortunately, scientists are still working to answer that question.

Russell remains optimistic. "It's not hopeless," she said. "On the horizon, there's some really interesting science being done."

Russell knows people are upset about CWD, and she's urging them to remain calm.

"As Americans in 2018, we're used to knowing. If we don't know, we just type it into Google. But the fact that we don't know everything about CWD is where our hope has to be. Scientific understanding is incomplete regarding prions. We don't fully understand how the misfolding happens. But once we figure that out, we may be able to find a way to prevent it. So my general point is don't despair," she said. "There's a lot of good research happening. We're not where we're going to be in five years."

She's also working with leaders from a cross-section of disciplines — agriculture, medical, conservation, science — to plan for the future.

"We need to operate as if we're going to get a solution," she said. "How do we do that? We need to keep the prions off our land. We need to act like we own this disease and we're going to win."

Eighteen CWD-positive animals were removed from the landscape as a part of post-season targeted-culling operations this year, she noted. Culling accounts for 4 percent of all CWD samples collected so far but has resulted in finding 48 percent of Missouri's CWD cases.

"That's actually quite awesome. We're not going to wipe this scourge away until we have a solution. But we have to keep our numbers low until then."

### **Aquatic Health in Missouri's Hatcheries**

Russell, whose background is in private veterinary practice, works closely with MDC's fish hatchery managers. It's an unexpected aspect of her new job, but one she relishes.

Normally, MDC has an aquatic animal health specialist on staff, but the specialized position has been unfilled since November 2017. Until a new person can be hired, Russell has been serving in a support role.

"How the hatcheries operate has been a steep learning curve, but an exciting one," she said.

MDC hatcheries have been in production for more than 75 years and annually produce millions

of fish. Since workers are exposed to the elements, it can be a tough, around-the-clock job. Floods, which inundated the hatchery buildings and forced trout out of the raceways, have only stressed the system more. Raising healthy fish is a bigger challenge than ever, she said.

Russell's role involves helping with diagnoses and writing prescriptions when necessary.

Parasites and bacteria exist naturally in reservoirs like Table Rock, which provides the fresh water for MDC's Shepherd of the Hills Hatchery.

"When you're dealing with high densities of fish in an intensive aquaculture operation, disease is easily moved," she said.

But with concerns that bacteria-related diseases, such as furunculosis, are becoming increasingly resistant, veterinarians are far more frugal and exacting before prescribing an antibiotic.

As of January 2017, the U.S. Food and Drug Administration requires a veterinary directive to prescribe medicines for disease.

"That's where Dr. Russell becomes instrumental," explained James Civiello, Shepherd of the Hills Hatchery Systems manager, noting she's been accessible for quick diagnoses. "She's really developed a vet-client relationship with us. Sherri has saved us

**“We know where we’ve been with Missouri conservation, and now we need to focus on where we’re going.”**







a lot of fish. We've seen less mortality because of the quick turnaround times."

For her part, Russell said she's been impressed with the hatchery teams' dedication, noting they work in all kinds of weather, over weekends and holidays, to keep their operations successful.

"It's phenomenal what they do," she noted. "The managers are hardworking and the technicians are nothing short of magicians."

### **Reverence for Missouri's Abundance**

Although she might not treat individual animals, the job still requires her to get out in the field regularly to meet with the biologists and technicians who do. There, she works to impart the knowledge she's gleaned after more than 30 years in veterinary medicine.

"I can't be everywhere all the time," she said. "But I can pass on what I know."

Not only does she teach the biologists how to keep themselves safe, she also advises them how to take the best care of the animals.

More than ever before, the public is sensitive to how animals are handled and treated. Whether a conservation agent is asked to respond to an injured fawn or a wildlife damage biologist is tasked with removing a nuisance beaver, Russell serves as a consultant, helping colleagues do their jobs in the most humane way.

**For hatchery staff to administer antibiotics, a veterinary food directive is required. By writing prescriptions when needed, Russell helps the staff obtain the medicated fish food they need to prevent bacterial disease.**

"Our goal is to live kindly and considerately with the wildlife around us," she said. "As I travel around the state, I have been continually impressed with the professional, kind people who make conservation their career."

She's committed to being a good steward of the natural resources in MDC's care.

A 1937 wildlife survey found fewer than 2,500 turkeys and 2,000 deer remained in the state. Prairie chickens, ruffed grouse, beavers, otters, and raccoons were scarce. Elk and buffalo were gone. That early survey laid the groundwork for the conservation tasks ahead — restocking programs, carefully thought out and scheduled hunting seasons, and extensive habitat improvements.

"We know where we've been with Missouri conservation, and now we need to focus on where we're going. CWD may pose a challenge to Missouri's deer herd, but, overall, the herd is in good condition," Russell said. "We need to continue our work."

A career working closely with domestic animals has deepened Russell's reverence for Missouri's wild species.

Rooted in Osage County, Russell feels conserving these natural resources for future generations is critical.

"I want my grandchildren to be able to hunt, fish, and enjoy the wild spaces," she said. "I wish people could just get outside and see the wonder of it all. Stewardship should be our guiding principle." ▲

*Kristie Hilgedick serves on MDC's communications team. She enjoys traveling to new places and spending time outdoors.*



# *On the*

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MDC's Effective Wingshooting workshops give hunters solutions to common mistakes.



# WING



## HOW TO HIT A FLYING TARGET

by Brent Frazee | photographs by Noppadol Paothong

**T**he camouflaged hunters hiding at the edge of a sunflower field got ready for what appeared to be some easy shots. A flock of doves was headed their way, flying easily within shotgun range.

Four shots rang out. And the birds kept flying, unscathed by the barrage, as the hunters looked at each other in disbelief. Sound familiar? It does to many Missouri hunters.

Whether it be the dove fields, a duck marsh, or the brushy borders of quail fields, there are plenty of missed shots each fall and winter. And frustration mounts, sometimes to the point that hunters leave the sport.

But there is hope, according to MDC's Eric Edwards and Mike Brooks. They lead a program called Effective Wing-shooting, which breaks down common mistakes shooters make and offers solutions to remedy them.

The workshop once was a stand-alone program, but now is incorporated into other MDC workshops, such as duck hunting and quail hunting.

The goal is still the same — to turn hunters into better wingshooters, reduce wounding rates of birds, and increase the fun.

"When hunters shoot a box of shells and only take three birds, they're practicing on the resource," said Brooks, who is the range manager at the Andy Dalton Shooting Range on the Bois D' Arc Conservation Area near Ash Grove. "It doesn't have to be like that.

"Knowing how to lead a bird, estimating distance of your target, having a gun that is properly fitted for you — that all goes into it. That, and a lot of practice."



## The Basics

Edwards and Brooks are accustomed to hearing, “Well, that’s the way I’ve always done it,” when hunters attend their classes.

But the old way isn’t always the best way.

“Sometimes we have to untrain them and reprogram them,” Brooks said.

The most common problem? The way shooters lead — or fail to lead — their target.

“We find that a lot of shooters aim at the target and stop their shotgun instead of swinging right through it,” said Edwards, outreach education coordinator for MDC. “They greatly underestimate how far they need to be in front of that bird.

“We teach them to start their swing in back of the bird and continue right through the target. They should focus on the water droplet on the beak of that bird. When they see daylight, they should slap the trigger while continuing to swing their gun.

“The British have a saying for that process: Butt, belly, beak, bang.”

Plenty of practice at the trap and skeet range will help hunters perfect that fluid motion of swinging through a target rather than stopping their shotgun and aiming, Edwards said.

But practice doesn’t always make perfect. A shooter should assume the proper stance, facing sideways at the target much

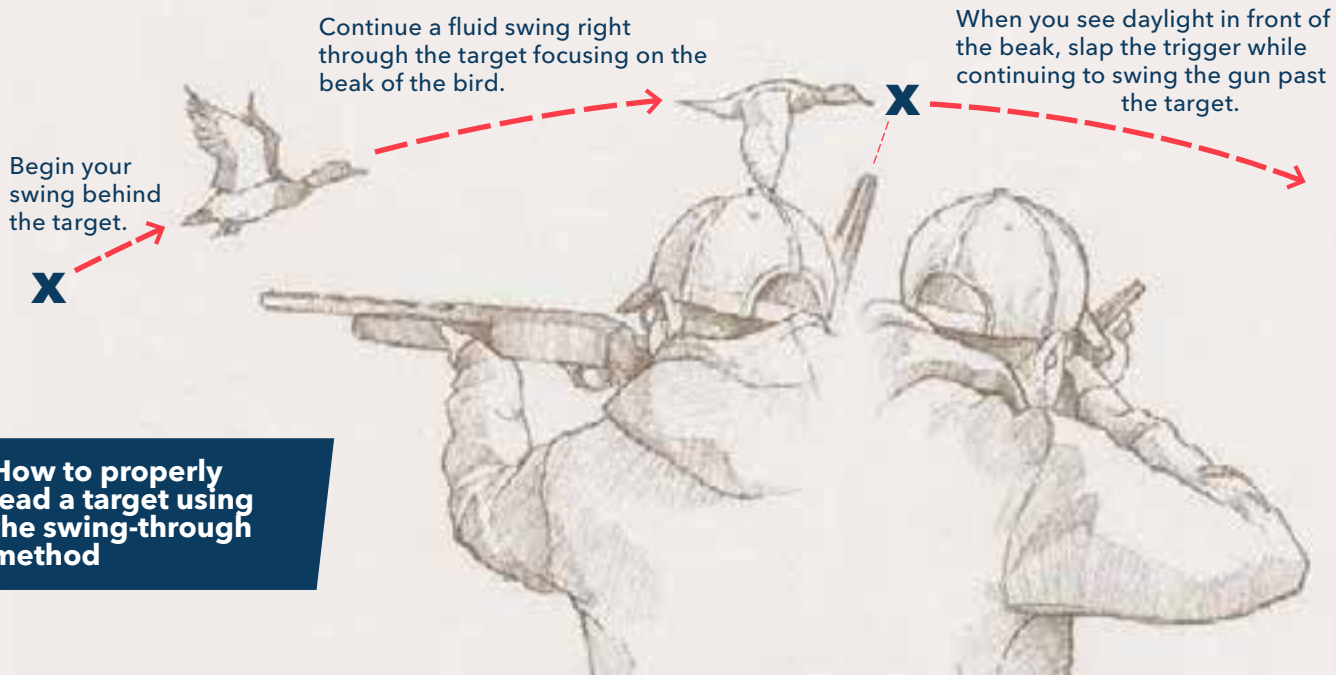




Aiming the shotgun barrel at the bird to estimate distance, called subtending, can assist hunters in making sure their prey is within effective harvest range, usually 20 to 30 yards.

### The Do's and Don'ts of the Field

- **Don't** "skybust." Hunters who misjudge distances and shoot at faraway ducks can cause problems for other parties on public land. The waterfowl often flare and refuse to come into decoys after the "warning shots." Or sometimes, they are wounded and fly off.
- **Do** wait for close shots, in the 30-yard range, and it will increase your chances of a clean kill and add to the enjoyment of your hunt.
- **Don't** "flock shoot." When a flock of ducks drops in, it's hard not to shoot into the middle of the concentration, figuring you're sure to hit something. That's the wrong approach.
- **Do** pick out a single bird and concentrate on shooting it, then move onto a second target.
- **Don't** get flustered by a covey rise. Some hunters forget their shooting form when a covey of quail gets up in front of them.
- **Do** concentrate on one bird instead of the entire group.
- **Don't** get psyched out by those smaller ducks, such as blue-winged teal. They have a reputation for being speed demons, but in reality, it just seems that way because of their small size and rapidly beating wings.
- **Do** pick up their flight early, and concentrate on swinging through your target.



**How to properly lead a target using the swing-through method**



**To properly mount the gun,** assume the proper stance facing sideways against the target with feet shoulder length apart (Step 1), push the gun out and up (Step 2), and then slide the stock backwards under the cheekbone (Step 3). When the gun is properly mounted, the butt stock and cheek on the comb should touch at the same time. Mounting the gun can be practiced at home during the off season with an unloaded firearm in front of a mirror.

### Step 1



### Step 2



### Step 3



the same as a batter faces a pitcher in baseball, with feet shoulder length apart. He or she should learn to mount the gun properly, pushing it away from the body and sliding the stock under the cheek bone and nestled against the shoulder.

"For a right-handed shooter, there should be two fingers' width from the tip of the nose to the right thumb," Edwards said.

The shooter should keep his cheek on the gun as he swings through his target.

For all of that to work, though, a shooter must have a shotgun that is fitted to his build. A stock that is too long or too short can throw things off.

"Gunsmiths have all kinds of ways to measure what your right fit is," Brooks said. "They can add length to the stock and they can shorten it so that the gun is right for your build."

## Bringing it to the Field

You've learned the basics. You're breaking clay targets at the range, and you've even tried sporting clays, which simulates hunting conditions.

It should be an easy transition to the hunting fields, right? Well, not so fast.

Brooks warns that hunters should practice with the same type of ammunition at the range that they will be using in the field.

"If a hunter practices with lead shot and then uses steel shot in the field, they will notice a difference," Brooks said. "Steel shot is lighter and travels faster."

And then, there is a matter of estimating distance.

"The leads you practiced at the range will be different in the field."





To increase harvest rate, responsible hunters should always pattern test their equipment using the ammunition, firearm, choke, and distance they plan to use. A larger shot size is required with steel shot when compared to lead shot.



A federal survey found that hunters take their first shots at ducks on average at 53 yards and at geese at 67 yards. In other words, way out of range.

Contrast that to most of the first shots that Edwards takes — at close range.

“There are hunters who can knock down a duck with a long shot,” Edwards said. “But you can increase the chances of wounding a bird and not getting a clean kill at that range, too.”

“I’m selective in choosing my shots. I won’t shoot at anything longer than 30 yards away.”

## Mastering Steel Shot

When surveys and monitoring programs in the 1970s showed that thousands of waterfowl were dying from ingesting lead pellets — and bald eagles were dying from eating the infected waterfowl — the federal government took action.

The U.S. Fish and Wildlife Service began phasing in a ban on the use of lead shot in the late 1970s and hunters reluctantly went to the cheapest nontoxic alternative, steel shot.

The transition was anything but smooth. Hunters complained that the new shot damaged shotgun barrels, was less effective, and threatened the future of waterfowl hunting.

The uproar got so bad during the phasing-in period that the Cooperative North American Shotgunning Education Program (CONSEP) was formed to show hunters how to make the transition to shooting steel shot.

Tom Roster, a nationally known ballistic expert, was hired as a paid consultant, and he dedicated countless hours shooting steel, exploring its characteristics, and teaching others.

He found steel shot can be very effective, but it takes a different approach than shooting lead shot.

For example, the effectiveness of shot sizes differ.

“He found that with steel shot you had to go two sizes larger than lead,” Brooks said. “For example, if you used a No. 6 shell in lead, you had to go to a No. 4 in steel.”

Shot characteristics also are different. Steel shot has a tighter pattern and a shorter shot string than lead, reducing the chances of a hunter getting “lucky” and having a few stray pellets hit a target with a misjudged shot.

But Roster maintains that the switch to steel shot has reduced wounding rates and is just as effective as lead. The key? Practice, practice, practice.

Even the complaint about steel damaging shotgun barrels has been resolved. Roster designed a way to encase the shot so that it could move through the gun without causing damage, a move now being used by manufacturers.

It’s summer and hunting seasons are still a long way off. But it’s not too early to start preparing.

Get that shotgun out and head to the trap range. Practice establishing your swing-through lead, experiment with different-sized shot, and even hit the sporting clays course.

By the time opening day arrives, you might be surprised at how many more birds you take home this fall for the dinner table. ▲

*Brent Frazee retired from The Kansas City Star in 2016 after 36 years as the outdoors editor. He continues to freelance for magazines and newspapers to support his habits — fishing and hunting. He lives in Parkville, Missouri, with his wife Jana and two labs, Zoey and Millie.*

# Get Outside

in JULY →

Ways to  
connect  
with nature



## Feeding Frenzy

Watch for young hummingbirds at feeders. Do you have nectar ready?

ST. LOUIS REGION

## Archery—Basics

Saturday, July 14 • 12-2 p.m.  
Rockwoods Reservation  
2751 Glencoe Road, Wildwood, MO  
Reservation required.  
Call 636-458-2236 by July 13  
Ages 10 and older

Archery is the skill of using a bow to propel arrows. Nearly everyone — regardless of age, size, or physical ability — can succeed at archery. Join naturalist staff to learn the basics of this fun and challenging sport and get a chance at real target shooting.



## Katy Did! Katy Didn't!

That's what the katydids' mating call sounds like. Listen for it from high in the treetops on hot summer nights.



## Walking in Spider Webs

Theodore Roosevelt once said, "Speak softly and carry a big stick; you will go far." We would revise that to say walk with a big stick in Missouri's woods in July and you will go far. Spiders build webs between trees at eye level. You'll need the stick to clear the way!



### Natural Events to See This Month

Here's what's going on in the natural world.



Rattlesnakes  
hunt at night



Young  
raccoons  
leave  
dens



Dragonflies  
lay eggs on  
ponds and  
streams



**SOUTHEAST REGION**

## Conservation Day Festival

Saturday, July 28 • 8 a.m.-12 p.m.

Cape Girardeau Conservation Nature Center

2289 County Park Drive, Cape Girardeau, MO 63701

No registration required. Call 573-290-5218 for information.

All ages

Have you ever wondered what environmental scientists do every day? Then stop in at the nature center to explore our displays, booths, and demonstrations to learn more about amazing projects in your area. If you would like to try your hand at being a biologist, help us with our Bio Blitz by collecting sightings of plants and wildlife around the nature center grounds. We will also have games, crafts, and a photo booth set up for you to take your picture with Smokey Bear.

## Nature's Fireworks

Mark your calendar for July 28 and find a good spot to view the **Southern Delta Aquarid meteor shower**. It peaks on that date.

## In Bloom

Look for **black-eyed Susans** and blazing star blooms while you are out discovering nature.

GET  
**NATURE**  
YOUR **WAY**

AT HOME OR  
ON THE GO



Get your **free** Missouri Conservationist at  
[mdc.mo.gov/conservationist](http://mdc.mo.gov/conservationist)



# Places to Go

## SOUTHEAST REGION

### Amidon Memorial Conservation Area

Natural events — ancient and modern — leave their marks on this Ozark favorite

by Larry Archer

✕ **Nature, both in the form of geologic oddities carved over a billion years and in severe weather lasting less than five hours, has noticeably marked Amidon Memorial Conservation Area (CA) in southeast Missouri.**

The first, the Castor River Shut-ins, is Missouri's only pink granite shut-ins. This gorge of granite rocks anchors the Castor River Shut-ins Natural Area, which makes up 209 acres of Amidon Memorial CA's 1,632 mostly forested acres. Away from the shut-ins, visitors can find evidence of what nature can do in hours rather than eons, according to Resource Forester Becky Fletcher, area manager.

"The giant storm in 2009, they called the super derecho, blew down about 70 percent of the trees out there, so there's a lot of new growth," Fletcher said. "You can still see the damage that was done by the storm, especially away from the shut-ins."

As the area heals from the damage caused by the storm's 90-mph winds, wildlife has taken advantage of the new undergrowth, and for hikers, there's a limited-time upside as well, she said.

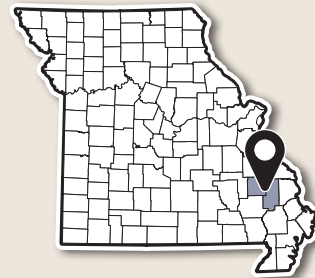
"It's a little more open on the ridgetops, so you can see a lot farther, but as the trees grow up, that'll change," Fletcher said.



The Castor River Shut-ins, Missouri's only known pink granite shut-ins, offers visitors a unique look at a geologic oddity more than a billion years in the making. The three-toed box turtle (left) is among the abundant wildlife that calls the glades along the shut-ins home.

LARRY ARCHER





## AMIDON MEMORIAL CONSERVATION AREA'S

1,632 acres straddle Bollinger and Madison counties.

From Fredericktown, take Route J east, then  
Route W south, and then County Road 208 east.

N37° 32' 3.84" | W90° 9' 39.96"

[short.mdc.mo.gov/ZqM](http://short.mdc.mo.gov/ZqM) 573-290-5730

### WHAT TO DO WHEN YOU VISIT



**Bird-Watching** Included in the National Audubon Society's Upper Castor/Whitewater Watershed Important Bird Area. The eBird list of birds recorded at Amidon Memorial CA is available at [short.mdc.mo.gov/Zqg](http://short.mdc.mo.gov/Zqg).



**Camping** Individual campsites. No amenities. Seasonal closures may apply.



**Fishing** Black bass, sunfish, white bass.



**Hiking** Cedar Glade Trail, a 1-mile loop, leads to the shut-ins, and several area access trails cross the forested areas.



#### **Hunting Deer and turkey**

Deer and turkey regulations are subject to annual changes. Please refer to the *Spring Turkey* or *Fall Deer and Turkey* booklets for current regulations. Also dove, rabbit, and squirrel.

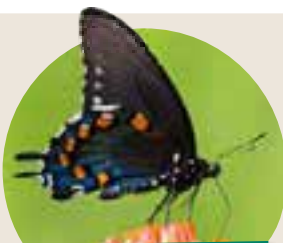


**Trapping** Special use permit required.

"Wild azaleas grow out there. They only grow in three or four counties in Missouri, and usually about late April, early May, they're blooming. They're one of those acid-loving species, and the granite soils are acidic."

—Amidon Memorial CA Manager Becky Fletcher

### WHAT TO LOOK FOR WHEN YOU VISIT



Pipevine swallowtail



Prairie lizard



Raccoon



Eastern chipmunk





## Chanterelles

*Cantharellaceae*

### Status

Common in suitable habitats

### Size

Height: 1–6 inches;  
Width: ½–6 inches

### Distribution

Statewide, particularly in moist woodlands and river bottoms



### Did You Know?

Chanterelles are a favorite among European chefs and are gaining popularity in the United States. If you collect more chanterelles than you can eat, preserve extra by sautéing them, then freezing.

Chanterelles are funnel- or trumpet-shaped mushrooms with wavy cap edges. Most are bright orange or yellow, although one, the black trumpet, is brownish black. Fresh chanterelles have a pleasant, fruity fragrance. To make sure you have a chanterelle, check the underside of the cap. Some species of chanterelles are nearly smooth underneath, while others have a network of wrinkles or gill-like ridges running down the stem. The ridges have many forks and cross veins and are always blunt-edged.



### LIFE CYCLE

These organisms spend most of the time as a network of fungal cells (mycelium) in the soil, associated symbiotically with tree roots. When ready to reproduce, the mycelium develops mushrooms, which produce spores and create new mycelia elsewhere. The fruiting season for chanterelles begins in May and continues through October. Early fall is a good time to find chanterelles because heavy undergrowth and insects are on the decline and fallen leaves haven't hidden them.



### ECOSYSTEM CONNECTIONS

A variety of organisms, from tiny insects to mammals, eat chanterelles. The fungus that gives rise to the mushroom forms mutually beneficial relationships with roots of trees, helping them absorb water and nutrients while the trees provide nourishment to the fungus.



# Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖



## Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at [short.mdc.mo.gov/Zi2](http://short.mdc.mo.gov/Zi2).

## FISHING

### Black Bass

Impounded waters and non-Ozark streams:  
Open all year

Most streams south of the Missouri River:  
May 26, 2018–Feb. 28, 2019

### Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2018

### Nongame Fish Gigging

Impounded Waters, sunrise to sunset:  
Feb. 1–Sept. 14, 2018

Streams and Impounded Waters,  
sunrise to midnight:  
Sept. 15, 2018–Jan. 31, 2019

### Paddlefish

On the Mississippi River:  
Sept. 15–Dec. 15, 2018

### Trout Parks

Catch-and-Keep:  
March 1–Oct. 31, 2018

Catch-and-Release:  
Nov. 9, 2018–Feb. 11, 2019

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at [short.mdc.mo.gov/Zib](http://short.mdc.mo.gov/Zib). Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at [short.mdc.mo.gov/ZZf](http://short.mdc.mo.gov/ZZf).

## HUNTING

### Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2018

### Coyote

*Restrictions apply during April, spring turkey season, and firearms deer season.*

Open all year

### Crow

Nov. 1, 2018–March 3, 2019

### Deer

Archery:

Sept. 15–Nov. 9, 2018

Nov. 21, 2018–Jan. 15, 2019

Firearms:

► Early Youth Portion (ages 6–15):  
Oct. 27–28, 2018

► November Portion:  
Nov. 10–20, 2018

► Late Youth Portion (ages 6–15):  
Nov. 23–25, 2018

► Antlerless Portion (open areas only):  
Nov. 30–Dec. 2, 2018

► Alternative Methods Portion:  
Dec. 22, 2018–Jan. 1, 2019

### Dove

Sept. 1–Nov. 29, 2018

### Groundhog (woodchuck)

May 7–Dec. 15, 2018

### Pheasant

Youth (ages 6–15):

Oct. 27–Oct. 28, 2018

Regular:

Nov. 1, 2018–Jan. 15, 2019

### Quail

Youth (ages 6–15):

Oct. 27–Oct. 28, 2018

Regular:

Nov. 1, 2018–Jan. 15, 2019

### Rabbit

Oct. 1, 2018–Feb. 15, 2019

### Sora, Virginia Rails

Sept. 1–Nov. 9, 2018

### Squirrel

May 26, 2018–Feb. 15, 2019

### Teal

Sept. 8–23, 2018

### Turkey

Archery:

Sept. 15–Nov. 9, 2018

Nov. 21, 2018–Jan. 15, 2019

Firearms:

► Fall: Oct. 1–31, 2018

### Waterfowl

See the Waterfowl Hunting Digest or visit [short.mdc.mo.gov/ZZx](http://short.mdc.mo.gov/ZZx) for more information.

### Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2018

### Woodcock

Oct. 15–Nov. 28, 2018



ILLUSTRATION: MARK RATHIEL



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The eastern red milksnake is one of Missouri's nonvenomous snakes. Though found statewide, it may be difficult to see during the dog days of summer. It prefers the underground — animal burrows and large rocks — when temperatures rise. This species feeds on small mice and snakes, helping to control those populations.

📷 by **Kevin Muenks**

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